TECHNICAL SPECIFICATIONS

WASHINGTON STATE FERRIES

M.V. TILLIKUM DRYDOCKING

CONTRACT NO. 00-6972

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TECHNICAL SPECIFICATIONS

For the following Technical Specifications, the Contractor is to provide all labor, material and equipment to accomplish each and every Bid Item unless otherwise specified.

The Specification Item sub-titles in brackets are for WSF internal use only, for Life Cycle Cost modeling. Bidders should ignore such bracketed sub-titles.

1. DRYDOCK VESSEL
{MAINTENANCE}

M.V. TILLIKUM Vessel Particulars:
Length: 310'-2", Beam: 73'-2", Draft: 15'-6", Gross Tons: 2,070.

A. Provide labor, material and equipment to drydock Vessel for cleaning, painting, inspections, and the work specified herein and any necessary repairs.

B. Block spacing shall be at twelve foot (12') centers. Provide drawing to the WSF Inspector indicating the block positions used.

C. Vessel shall be blocked to expose the block positions used at the previous docking. **Attachment No. 2**, "BLOCK POSITION FORM" showing previous docking position, is provided for reference.

2. TEMPORARY SERVICE
{MAINTENANCE}

A. Install one (1) telephone on board in a location designated by the Vessel Staff Chief Engineer. The telephone is to have one (1) outside line with toll-free access to Seattle and vicinity and, if different, one (1) line for local numbers. The telephone shall have touchtone service if available from the Contractor's telephone system.

B. Provide and maintain electricity, water, safe lighted gangway and trash removal services while Vessel is in the Contractor's facility.

C. Provide Safety and Security for the entire Vessel throughout this Contract period until such time as the WSF has accepted redelivery of the Vessel. Every reasonable precaution shall be taken to protect the Vessel from the hazards of fire, flooding, pilferage, malicious damage, and other events including cataclysmic phenomena of nature.

D. Provide and maintain comprehensive and effective fire prevention and fire detection, and fire fighting programs and systems sufficient to ensure the safety and integrity of the Vessel. Provide personnel trained in shipboard fire fighting techniques and also trained to cooperate with and assist local fire fighting organizations. Provide sufficient shore fire lines to ensure an adequate supply of fire fighting water, at sufficient pressure, and maintain an adequate number of tested fire-hoses aboard the Vessel to effectively fight fires at any location in the Vessel.

E. Provide and maintain portable fire extinguishers in sufficient quantity, and of the appropriate type, to combat local fires of any class. Provide sufficient fire watches, including roving watches as may be required, to ensure that fires that may be inadvertently started by welding sparks or heat, electrical malfunction, or spontaneous combustion are detected, reported and promptly extinguished.

3. ZINC RENEWAL
{MAINTENANCE}

A. Renew bolt-on zincs at the following locations: Port and Starboard sea chests, forward and aft, total of eight (8) zinc's.

4. RUDDER INSPECTION, NO. 1 AND NO. 2 ENDS
{MAINTENANCE}

A. Pressure-test rudders for leaks in the presence of the WSF and USCG Inspectors and the Vessel Staff Chief Engineer and provide three (3) copies of the test results to the WSF Inspector **within 24 hours** of Vessel Drydocking. Test pressure shall be 42" of water with Manometer, or 1.5 PSI on acceptable calibrated pressure gage that has 1.5 PSI at mid scale range. Accepted test is no leaks for One (1) Hour. Dispose of any water in accordance with Local, State, and Federal laws and regulations.

B. Take and record clearances of rudder pintle and rudderstock bearings on No. 1 and No. 2 End rudders and submit three (3) copies of a written report of findings to the WSF Inspector **within 24 hours** of Drydocking.

C. Remove interferences as necessary to access the No. 1 and No. 2 rudder packing glands.

D. On No. 1 and No. 2 Rudders remove existing packing; clean packing area and install new Contractor's furnished packing. New packing will be same type, quantity and size as removed. Provide Vessel Staff Chief Engineer with one (1) extra set of packing.

E. Secure all loose gland studs and double nut the studs after installation and adjusting of new packing.

F. Make up packing glands and reinstall interferences in good order upon completion of all work. Test deck access plate for water leaks, any leaks will not be accepted.

5. PROPELLER INSPECTION, NO. 1 AND NO. 2 ENDS {MAINTENANCE}

A. Polish the No.1 and No.2 End propellers by power disk sanding, using 80 grit or finer abrasive. Thoroughly clean propeller hub and blades for nondestructive testing.

B. Inspect No.1 and No.2 propellers for damage and proper blade track. Conduct a Nondestructive test using a qualified NDT Inspector, for surface cracks on the blades in the presence of the WSF and USCG Inspectors, Vessel Staff Chief Engineer, perform test and submit three (3) copies of a written report of findings to the WSF Inspector within **two (2) days** after drydocking the Vessel.

6. OUTER AND INNER SHAFT SEAL REPLACEMENT, NO. 1 AND NO. 2 ENDS {MAINTENANCE}

NOTE:
Both the No. 1 and No. 2 End Propellers and the shaft SKF couplings will need to be removed to accomplish the required work in this Item.

A. Erect, modify, and remove staging in the area around No. 1 and No. 2 End Propellers as required to accomplish all affiliated work and inspections.

B. Remove No. 1 and No. 2 Propellers and disconnect the shaft SKF coupling to allow enough clearance to replace the existing seals and liners.

C. Remove and restore all interferences including insulation disturbed by this Item.

D. Drain all oil from the outer Waukesha oil seal system, including the stern tube cavity. Dispose of oil (approximately **150 gallons**, each End). Clean the head tank and the bilge sump tank. Flush the piping from the head tank to the bilge sump tank by using ten (10) gallons of clean system oil poured down the piping from the head tank to the bilge sump tank. Clean flushing oil from the bilge sump tank. Close up the head tank and sump tank with new Contractor furnished fasteners and gaskets.

E. Remove the existing outer and inner Waukesha Seals and Liners. Replace with new WSF supplied outer and inner Eagle Seals and Liners. Provide the services of an authorized Eagle Seal service Representative during the installation of the new Seals and Liners. The Eagle Seal Representative is: Sound Propeller, 1608 Fairview Ave. E., Seattle, WA. 98102, Phone No.: (206)-325-5722. Re install SKF Coupling. Dial in the outboard and inboard liner after propeller installation, run out not to exceed .005". Reading to be witnessed by the WSF Inspector and the Vessel Staff Chief Engineer. Submit three (3) copies of a written report of the readings to the WSF Inspector.

F. Using a feeler gauge to take stern tube bearing clearances. Exercise care with the feeler gauge so as not to break off leaves in the bearing. Reading to be witnessed by the WSF Inspector and the Vessel Staff Chief Engineer. Submit three (3) copies of a written report of the readings to the WSF Inspector.

G. Inspect shaft taper, shaft key and keyway, propeller shaft nut and threads by approved NDT procedure in presence of the WSF and USCG Inspectors, and Vessel Staff Chief Engineer. Install No. 1 and No. 2 Propellers after acceptance of testing by WSF Inspector.

H. Propeller Shaft Nut hardening to be witnessed by the WSF and USCG Inspectors, and the Vessel's Staff Chief Engineer.

I. Take Eagle Seal bearing wear down readings after installing seals, in the presence of the WSF Inspector and the Vessel Staff Chief Engineer. Submit three (3) copies of the written reports of the readings to the WSF Inspector within **three (3) hours** of inspection. Upon completion of taking wear down readings, lock wire the liner and housing fasteners. Fill the outer seal with Hyperlube or STP.

J. Prior to installing the rope guards remove the existing zincs and replace with new zincs. Take run out readings on the face of the propeller and the counter bore for the seal. Dial in the outboard liner after propeller installation, run out shall not to exceed .005". Reading to be witnessed by the WSF Inspector and the Vessel Staff Chief Engineer. Submit three (3) copies of a written report of the readings to the WSF Inspector.

K. Fill the stern tube system with WSF furnished oil.

L. Transport the removed outer Waukesha Seals and Liners to the WSF Warehouse at 6th Ave. South, Seattle, WA. Inform the WSF Inspector 24 hours prior to transporting them.

7. VOID INSPECTION
(MAINTENANCE)

A. Open the eight (8) voids and close up when completed.

B. Provide the services of a Marine Chemist to certify voids "SAFE FOR WORKERS". Provide lighting and ventilation necessary to facilitate USCG inspection and any other work to be performed in the voids.

PAINTING OF VESSEL AND HULL PRESERVATION

Special Note

(ATTACHMENT NO. 1)

Area Preparation, Surface Preparation, Paint Coatings, and Inspection for Vessel's hull, curtain plates, casing and super structure shall be in accordance with Washington State Ferries Marine Coating Specification 1/03 unless otherwise specified in the following Specifications.

8. FRESHWATER WASH OF VESSEL HULL
{MAINTENANCE}

A. Within twenty-four (24) hours of Dry-Docking Vessel, provide labor, material and equipment to Low-Pressure Water Clean (LP WC) at 3,000 to 5,000 PSI in accordance with SSPC-SP 12/NACE 5. The wand shall be held no more than 12 inches from the surface being washed. Wash the entire Hull, from the top of the guard to the keel, including flat keel, sea chests, strainer plates, propellers, and rudders. The wash shall leave no visible growth or residue after the hull dries from washing. Remove and replace the sea chest strainer plates as necessary. Prior to reinstalling sea chest strainer plates, the Contractor shall conduct an inspection with WSF Inspector and the Staff Chief Engineer.

9. PREPARATION FOR EXTERIOR HULL PAINTING
{MAINTENANCE}

NOTE:
Care shall be taken to avoid damage to the CAPAC anodes and reference cell. The anodes are located at frame 54 port and starboard, both Ends, approximately nine feet (9') above the keel. The reference cell is located on the starboard side toward the No. 1 End.

A. Provide covering and protection on propellers, propeller bearings, rudder stock pintle pins and bearings, exposed shafting, CAPAC anodes and reference cells, any removed sea valves, all through-hull penetrations and entrance ways to protect and prevent grit blast material from causing damage or entering the Vessel. The WSF Inspector and Vessel Staff Chief Engineer prior to grit blasting shall inspect all protective coverings and hull penetration blanks.

10. ANODE AREA CAPASTIC REPAIR
{MAINTENANCE}

NOTE:
For bidding purposes, assume that **25 Square Feet** will require repair. The capastic shall be applied to a minimum thickness of 1/8 inch in the area of the shield out from the faired in area around the anode. The capastic shall be troweled so as to achieve a smooth overall surface.

A. Renew capastic around the CAPAC anodes using 'Capastic' epoxy troweling compound made by ELECTROCATALYTIC, INC.

B. Build up a minimum of 22 mils DFT of epoxy Anti-Corrosion coating over the capastic areas and the secondary dielectric shield areas.

11. GRIT BLAST / PRESSURE WASHING OF THE HULL
{MAINTENANCE}

NOTE:
The Contractor shall have the option to UHP-WJ4, Ultrahigh-Pressure Water Jetting only if the hull profile is taken and is within the required profile in **Attachment No. 1** and approved by the WSF Inspector.

NOTE:
For purpose of bidding assume that **3,000 Square Feet** (SF) of hull will require grit blasting to SSPC-SP6, Commercial Blast Cleaning. Upon completion of hull blasting, the Contract will be adjusted upward or downward to account for the actual scope of blasting authorized by the WSF Inspector.

A. Grit blast areas of abrasion, corrosion or steel repairs on the hull from the top flat surface of the rub rail down to the keel, including flat keel, sea chest, strainer plates and rudders to SSPC-SP 6, Commercial Blast Cleaning.

B. The anti-fouling coating, for at least two inches (2") bordering the blasted area, shall be removed to existing ANTI-CORROSIVE COATINGS and feathered to a smooth surface.

12. PAINTING OF VESSEL HULL, ANTI-CORROSION COATING {MAINTENANCE}

NOTE:
For bidding purposes, assume that **3,000 SF** of the hull will require the ANTI-CORROSIVE COATINGS. The Contract will be adjusted upward or downward, using the square footage determined in Grit Blasting Hull Item.

A. Apply one (1) coat of INTERNATIONAL Intertuf 262 epoxy, Red, to a minimum of 5 mils (DFT) to surface areas prepared in Grit Blasting Hull Item.

B. Apply one (1) coat of INTERNATIONAL Intertuf 262 epoxy, Gray, to a minimum of 5 mils (DFT) of contrasting color to all surfaces painted in paragraph "A" of this Work Item.

13. PAINTING OF VESSEL HULL, BELOW WATERLINE ANTI-FOULING (SPOT COAT) {MAINTENANCE}

NOTE:
For bidding purposes, assume that **2,000 SF** of the hull will require the ANTI-FOULING COATINGS. The Contract will be adjusted upward or downward, using the square footage determined in Grit Blasting Hull Item.

A. Furnish and apply one (1) coat of INTERNATIONAL Interspeed Antifouling, BRA 640 RED, to a minimum of 4 mils (DFT) to all surfaces painted below the waterline in Item 12.

14. PAINTING OF VESSEL HULL, BELOW WATERLINE ANTI-FOULING (FULL COAT) {MAINTENANCE}

A. Furnish and apply one (1) full coat of INTERNATIONAL Interspeed anti-fouling BRA 642 BLACK, to a minimum of 6 mils (DFT) to all surfaces of hull below the waterline, including the sea chests and sea chest plates.

15. PAINTING OF VESSEL HULL ABOVE THE WATERLINE {MAINTENANCE}

NOTE:
For bidding purposes assume that **1,000 SF** of the hull above the water line will require TOP COAT painting. The Contract will be adjusted upward or downward using the square footage determined in the work Item "Blasting of the Hull".

A. Furnish and apply one (1) coat of INTERNATIONAL Intercare 755, WSF Medium Green, to a minimum of 2 mils (DFT) to all surfaces painted in Item 12.

16. PAINTING OF VESSEL GUARD
{MAINTENANCE}

A. Furnish and apply one (1) coat of INTERNATIONAL Intertuf 262, Series epoxy, Black, to a minimum of 5 mils (DFT) to the entire guard.

17. DRAFT HULL AND RUDDER MARKINGS
{MAINTENANCE}

A. Furnish and repaint all draft marks and underwater hull markings, using INTERNATIONAL Interlux Y5584, Shark White**.**

18. PREPARATION AND PAINTING OF THE NO. 2 END OF THE TEXAS DECK
{MAINTENANCE}

A. On deck areas of the Texas deck perform a Low Pressure Water Cleaning (LP WC) at 3,000 - 5,000 PSI to achieve a condition of SC-1 IAW Table 2 (Non-visual Surface Preparation Definitions) in SSPC-SP 12/NACE 5 Publication, in Zone 1. The wand shall be held no more that twelve inches (12") from surface being washed. Use **International GMA** or equal when washing. Protect Passenger deck windows from water wash and grit blasting.

B. Clean windows upon completion of blasting and painting, any damage or paint on the windows shall be repaired by the Contract prior to the completion of this Contract.

C. Perform an inspection of the entire fresh water washed areas to the satisfaction of the WSF Inspector prior to proceeding with any paint preparation or painting.

D. From amidships, the middle of Engine Exhaust Stacks, to the end of the Texas deck at the No. 2 End, remove existing paint to SSPC 6, Commercial Blast Cleaning, on the deck surface, up six inches (6") on bulkheads; and deck side of coaming.

NOTE:
The Contractor shall have the option to UHP-WJ4, Ultrahigh-Pressure Water Jetting only if the profile is taken and is within the required profile in **Attachment No. 1** and approved by the WSF Inspector.

E. Apply one (1) coat of Wasser MC Miozinc Green, at a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces, including inboard surface of deck side of coaming, and up six inches (6") on bulkheads (Dado).

F. Apply one (1) coat of Wasser MC Luster, Light Haze Gray, Mix in Aluminum Oxide 24-25 mesh (1:1), at a minimum of 3 mils (DFT) to all Non skid surfaces, similar to No. 1 End. Do not apply non-skid within six inches (6") of bulkheads and deck side of coamings.

19. FULL TOP COAT OF HAZE GRAY TO THE TEXAS DECK {MAINTENANCE}

A. Apply one (1) full coat of Wasser MC Luster, Light Haze Gray at a minimum of 3 (DFT) to all deck surfaces of the Texas Deck, including all deck side coamings and six (6") inches on the deck from the bulkhead and six inches (6") up the Bulkheads (Dado).

20. PAINTING OF THE FOUR PICKLE FORKS DECK SURFACES {MAINTENANCE}

A. On all four pickle forks perform a Low Pressure Water Cleaning (LP WC) at 3,000 - 5,000 PSI to achieve a condition of SC-1 IAW Table 2 (Non-visual Surface Preparation Definitions) in SSPC-SP 12/NACE 5 Publication, in Zone 1. The wand shall be held no more that twelve inches (12") from surface being washed. Use **International GMA** or equal when washing.

B. Perform an inspection of the entire fresh water washed areas to the satisfaction of the WSF Inspector prior to proceeding with any paint preparation or painting.

C. All four pickle forks shall be prepared to an SSPC-SP 6, Commercial Blast Cleaning, from the entrances of the shelter deck to the ends of the pickle forks, including the deck side of the coaming.

NOTE:
The Contractor shall have the option to UHP-WJ4, Ultrahigh-Pressure Water Jetting only if the profile is taken and is within the required profile in Attachment No. 1 and approved by the WSF Inspector.

D. Apply one (1) coat of Wasser MC Miozinc Green, at a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces.

E. Apply one (1) coat of Wasser MC Luster, Light Haze Gray, Mix in Aluminum Oxide 24-25 mesh (1:1), at a minimum of 3 mils (DFT) to all Non skid surfaces, similar to No. 1 End. Do not apply non-skid within six inches (6") of bulkheads and inboard side of coamings.

F. Apply one (1) coat of Wasser MC Luster, Haze Gray, at a minimum of 3 mils (DFT) to all areas prepared in this Item, including surrounding coamings and 6" on the deck from the comings and six inches (6") up the Bulkheads (Dado).

21. REPLACE FLANGE PLATE, CLEAT AND BASE PLATE {MAINTENANCE}

A. Remove and replace 8" X 3" (horizontal) flange plate and the 7" welded cleat and a ¼ " base plate located on the Aft Port Side MES station. Use the existing cleat location as measurement of the center for the 24-inch flange plate removal.

B. All new material will be ASTM 36, and be prepared to an SSPC-SP 10, Near-White Blast Cleaning.

C. Cleat and base plate shall be galvanized.

D. All welding will be approved by the WSF and USCG Inspectors and Vessel Staff Chief Engineer.

E. Conduct a satisfactory test of welds that is approved by the WSF and USCG Inspectors. Testing to be witnessed and approved by WSF and USCG Inspector, and Vessel Staff Chief Engineer.

F. All painting will be included in Item "Painting the Vehicle Deck Area", including the exterior of the Curtain Plate.

22. INSPECTION OF SEWAGE AND LIFT TANK {MAINTENANCE}

NOTE:

Capacity of the sewage tank is **approximately 9,700 gallons** and the sewage lift tank is **approximately 80 gallons**. The tanks will be pumped down prior to arrival of the Vessel at the Contractor's facility. However, the Contractor is responsible for disposing of whatever effluent, sludge or accumulation remains. It should be considered HAZARDOUS in that sludge may contain harmful bacteria and emit poisonous and flammable gases.

A. The sewage holding tank and lift tank shall be opened, cleaned, sanitized and certified to be gas and toxic vapor free, and obtain a Marine Chemist certificate for "SAFE FOR WORKERS" and "SAFE FOR HOT WORK". Maintain the certificate during the course of the work.

B. Plug internal openings so there is no leakage. Any leakage after first Cleaning and Certification shall be the Contractors responsibility and to clean, sanitized and obtain a new Certificate as stated in paragraph A.

C. Inspect the interior of the tanks for deteriorated of steel, coatings and fittings. WSF Inspector will be notified twenty-four (24) hours prior to inspection and shall be present during the inspection. Submit a written report of the findings to the WSF Inspector.

D. Upon completion of all work, close up the tanks using new fasteners, washers, grommets and gaskets.

E. Provide two (2) sani-cans, one of them being a large size, located on the **Lower** Vehicle deck and provide all required servicing and cleaning until all affiliated work is complete. **These are for the WSF Vessel's Crew.**

23. PREPARATION AND PAINTING OF SEWAGE TANKS AND LIFT TANK

{MAINTENANCE}

NOTE:
For bidding purposes, assume **400 SF** for the Sewage tank and **100 SF** for the Sewage Lift Tank will require surface preparation and re-coating. The Contract will be adjusted upward or downward to account for the actual area authorized by the WSF Inspector.

A. Prepare all areas affected by this work to an SSPC-SP 3, Power Tool Cleaning. Apply two (2) coats of INTERNATIONAL Intertuf 262 series Epoxy, to a minimum of 5 mils (DFT) each coat for a total minimum of 10 mils (DFT). Clean, gas free and inspection.

24. INSPECT NO. 1 AND NO. 2 POTABLE WATER TANKS

{MAINTENANCE}

NOTE:
This work shall be conducted as early as possible to ensure Vessel drinking water is certificated to be safe for passengers and crew prior to Contract Completion date.

A. Potable water tanks shall be opened, cleaned, and certified to be gas and toxic vapor free, and obtain a Marine Chemist certificate for "SAFE FOR WORKERS" and "SAFE FOR HOT WORK". Maintain certificate until completion of all affiliated work.

B. Plug internal openings so there is no leakage. Any leakage after first cleaning and certification shall be the Contractors responsibility and to clean and obtain a new Certificate as stated in paragraph A.

C. Inspect the interior of the tanks for visual deteriorated coatings, steel and fittings. WSF Inspector will be notified twenty-four (24) hours prior to inspection and shall be present during the inspection. Submit a written report of the findings to the WSF Inspector. Upon completion of any work in the tanks, close up using new fasteners, washers, grommets and gaskets.

D. Provide a five (5) gallon bottled water dispenser with hot and cold taps for use by the Vessels Crew in the EOS area, with two (2) five gallons of bottled water per day (water bottles must be sealed and fresh) until the Potable Tanks are certified to be safe for Passengers and Crew.

E. Upon completion of inspection and/or painting of the potable water tanks they shall be cleaned, disinfected and flushed in strict accordance with the requirements of regulatory cognizant agencies. It is recommended that the disinfecting procedures outlined in the WHO Guide to Ship Sanitation, Annex 1, be consulted as providing an acceptable method of disinfecting. The Contractor shall provide the WSF Inspector with a copy of the Contractor's chlorinating procedure that he intends to use for this Contract prior to sanitizing the potable water system**.**

F. The potable water system shall be flushed sufficiently that water drawn from the most remote tap of faucet is free from all color or taste of paint, preservative, or disinfectant.

G. Certificates of disinfecting shall be provided to the WSF Inspector within **Twenty-four (24) hours** of the completion of this Contract.

25. PREPARATION AND PAINTING FOR NO. 1 AND NO. 2 POTABLE WATER TANKS

{MAINTENANCE}

NOTE:
For bidding purposes assume that there is a total of **300 SF** of preparation and painting required on the interior of **each** potable water tank **(Approx. Capacity 5,500 Gallons each)**. After tanks have been certified for entry inspect each water tank. The Contract will be adjusted for actual area prepared as authorized by the WSF Inspector.

A. Prepare areas corrosion and abrasion to an SSPC-SP3, Power Tool Cleaning.

B. Apply two (2) coats of International Interline 925, at a minimum of 5 mils (DFT) each coat, to prepared interior surfaces of the potable water tanks. Allow no less than seven (7) days paint cure time with the tanks well ventilated, **prior** to flushing the tanks.

C. Upon completion of painting the potable water tanks they shall be cleaned, disinfected and flushed in strict accordance with the requirements of cognizant regulatory agencies. It is recommended that the disinfecting procedures outlined in the WHO Guide to Ship Sanitation, Annex 1, be consulted as providing an acceptable method of disinfecting. The Contractor shall provide the WSF Inspector with a copy of the Contractor's chlorinating procedure that he intends to use for this Contract prior to sanitizing the potable water system**.**

D. The potable water system shall be flushed sufficiently that water drawn from the most remote tap of faucet is free from all color or taste of paint, preservative, or disinfectant.

E. Certificates of disinfecting shall be provided to the WSF Inspector within **Twenty-four (24) hours** of the completion of this Contract.

26. DRAIN KEEL COOLERS
{MAINTENANCE}

A. Drain the cooler system and dispose of the cooling water. The crew will secure the head tanks and minimize the amount of liquid drained. Estimate 1,500 gallons of NALCOOL-treated water for disposal. The water will contain no chromates.

B. Secure all drain outlets and add enough water for testing to ensure there are no leaks, test shall be a minimum of 2 hours, prior to adding water treatment.

C. Vessel crew will refill the keel cooler water system once testing is completed.

27. INSERT NEW DECK STEEL
{MAINTENANCE}

A. Remove wasted steel and replace with new steel of 12.75 lb. Plate located on the Vehicle deck as shown in **Attachment No. 3**, Deck Steel Replacement No. 1 End, approximately **70 SF** of (5/16) 12.75 pound plate and **Attachment No. 4,** Deck Steel Replacement No. 2 End**,** approximately **175 SF,** of (5/16) 12.75 pound plate, all plating to be certified ABS Grade A.

NOTE:
For bidding purposes, assume 245 SF for Deck Steel Replacement. The Contract will be adjusted upward or downward to account for the actual area authorized by the WSF Inspector.

B. Obtain a Marine Chemist certificate for "SAFE FOR WORKERS" and "SAFE FOR HOT WORK". Maintain the certificate during the course of the work.

C. Remove and restore all interferences including insulation disturbed by this Item.

D. All welding will be approved by the WSF and USCG Inspectors, and Vessel Staff Chief Engineer.

E. Conduct a satisfactory test of welds that is approved by the WSF and USCG Inspectors, testing to be witnessed and approved by WSF and USCG Inspector, and Vessel Staff Chief Engineer.

F. Prepare all new steel to an SSPC-SP10, Commercial Blast Cleaning, prior to installing. Apply one (1) coat Wasser MC Miozinc Green, to a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces. Apply one (1) coat Wasser MC CR Buff, to a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces. Hand-stripe all edges. Topcoat with Wasser MC Luster, to a minimum of 3 mils (DFT) to match surrounding.

G. Prepare all existing surfaces affected by this work to an SSPC-SP3, Power Tool Cleaning. Apply one (1) coat Wasser MC Miozinc Green, to a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces. Apply one (1) coat Wasser MC CR Buff, to a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces. Hand-stripe all edges. Topcoat with Wasser MC Luster, to a minimum of 3 mils (DFT) to match surrounding color.

H. To all Non-skid areas apply one (1) coat of Wasser MC Luster, Dark Haze Gray, Mix in Aluminum Oxide 24-25 mesh (1:1), at a minimum of 3 mils (DFT) to all Non-skid surfaces. Do not apply non-skid within six inches (6") of bulkheads, bulwarks and coamings. Topcoat with Wasser MC Luster, to a minimum of 3 mils (DFT) to match prior color, Dark Haze Gray or Bright Yellow.

28. INSTALLATION OF AUTOMATIC DRAFT INDICATION SYSTEM {NAVIGATION}

A. Install the WSF furnished Automatic Draft Indication System as indicated on **Attachment No. 5**, M.V. TILLIKUM, titled "Automatic Draft Indication System Hull Installation", WSF Dwg. No. 8403-607-002-01, Rev -, dtd 1/25/05; **Attachment No. 6**, M.V. TILLIKUM, titled "Automatic Draft Indication System Electrical Installation", WSF Dwg. No. 8403-607-095-01, Rev -, dtd 3/21/05 and **Attachment No. 7**, General Equipment and Technical Specifications of the Automatic Draft Indicator System, Weir-Jones Engineering Document 8268-adis-proposal-Rev A0.

B. System Installation will include four (4) each, ultrasonic transducers and mounting hardware. Two (2) each, wheelhouse display units, One (1), each system printer and all cabling, connection boxes and hardware.

C. Insure when mounting the tubes into the guard that they are installed as shown in the **Attachment No. 5** drawing.

D. When mounting the Processor into the void space beneath No. 1 Pilot house, weld two (2) angle steel pieces, the flanges will be two inches (2") wide, on the vertical framing on the starboard side. Template/Measurement for the two (2) flanges will meet the Processor box mounting holes. The Processor Box will be bolted to the mounting flanges using Stainless Steel Bolts, lock washers and Nuts. (for informational purpose, these mount flanges will also be used to mount the Processor box for the Satellite Compass Installation).

E. Remove and restore all interferences including insulation disturbed by this Item.

F. Provide support for conducting an operational test to the satisfaction of the Weir-Jones Engineering Ltd., the WSF and USCG Inspectors. Provide WSF Inspector with three (3) written copies of the test results.

NOTE:

Contractor is to schedule the times for the Weir-Jones Technical Representative in advance time to ensure Technical Representative will be available.

G. All new steel will be prepared to a SSPC-10, Near White Blast Cleaning. Existing painted surfaces affected by this work will be prepared to a SSPC-3, Power Tool Cleaning. To prepared surfaces apply one (1) coat Wasser MC Miozinc Green, to a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces. Apply one (1) coat Wasser MC CR Buff, to a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces. Hand-stripe all edges. Top-coat with Wasser MC Luster, to a minimum of 3 mils (DFT) to match exiting/surrounding colors.

H. Prepare all other existing surfaces affected by this work to an SSPC-SP3, Power Tool Cleaning. Apply one (1) coat Wasser MC Miozinc Green, to a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces. Apply one (1) coat Wasser MC CR Buff, to a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces. Hand-stripe all edges. Topcoat with Wasser MC Luster, to a minimum of 3 mils (DFT) to match surrounding color.

29. RADAR PLATFORM MODIFICATIONS

{NAVIGATION}

A. Remove the insulation that is located under the pilothouse deck in the location of the existing outboard radars. Remove and restore all interferences including insulation disturbed by mounting of Items and installing transits.

B. Prepare areas to obtain a Marine Chemist certificate for "SAFE FOR WORKERS" and "SAFE FOR HOT WORK". Maintain the certificate during the course of the work for welding in new radar pedestals.

C. Remove the existing radar pedestals in the No. 1 and No. 2 pilothouses that are on the outboard of the inner radar. Weld in new platforms to the deck that are five inches (5") high with a top flange of three inches (3") to accept the new WSF furnished radar units. Size of pedestal 21 ¼" wide (P/S) and 22" long (Bow to stern).

D. Provide staging for the mounting of new antennas for the WSF Electric Contractor.

E. Furnish and install one (1) new MCT Nelson RGS No.6, Steel, deck penetration under the outboard radar in each Pilot House.

NOTE:

Wherever new penetrations are required they shall maintain the watertight and fire ratings of the bulkhead or deck being penetrated. Existing non-poured bulkhead and deck penetrations may be reused. New Multi-Cable transits shall be Nelson type. Test all deck, bulkhead and hull penetrations in company with and to the satisfaction of the WSF and USCG Inspector, and the Vessel Staff Chief Engineer.

F. Install two (2) Stuffing Tubes size 1 ½" to fit new cables from Radars to Antennas.

G. Provide a lifting service for placing new equipment to the pilothouse and the removal of equipment from the pilothouse.

H. All electrical and connection of cables will be accomplished by WSF Vendor. In addition, the Vender will remove Radars, platforms, risers, cable removals and connections, all re-installation of equipment, testing and commissioning of the Radar system.

I. Prepare all surfaces affected by this work to an SSPC-SP3, Power Tool Cleaning. Apply one (1) coat Wasser MC Miozinc Green, to obtain 3 to 4 mils (DFT) to all new surfaces and prepared surfaces. Apply one (1) coat Wasser MC CR Buff, to obtain 3 to 4 mils (DFT) to all new surfaces and prepared surfaces. Hand-stripe all edges. Top-coat with Wasser MC Luster, to a minimum of 3 mils (DFT) to match surroundings.

30. SATELLITE COMPASS INSTALLATION
{NAVIGATION}

A. Install WSF furnished FURUNO Satellite Compass, Model SC-110 in accordance with **Attachment No. 8**, M.V. Tillikum, WSF Dwg. No. 8403-647-094-01, titled "Satellite Compass Installation Wiring Diagram", Rev. A, dtd 3/31/05; **Attachment No. 9**, M.V. Tillikum, Dwg No. 8402-647-015-01, titled "Antenna Foundation for SC110 Satellite Compass Location and Construction Details, Rev -, dtd 1/13/05.

B. Install the WSF furnished Satellite Compass Antenna on top of the No. 1 End mast as shown on **Attachment No. 9**. Orientation of the antenna to the Vessel fore and aft line is critical. Reposition the LAN Antenna so no interference with the Satellite Compass Antenna, reposition means loosening the LAN Antenna brackets and shift the LAN antenna away from the ends of the Satellite Compass Antenna ends.

C. Install cable and cable runs from new antenna down the mast to the aft bulkhead of the overhead of the Fan Room. Install new transit watertight penetrations in the aft bulkhead of the overhead of the Fan Room of the size and type to allow the antenna leads to pass through. Install cable run through fan room into Pilothouse void using existing bulkhead transit.

NOTE:
Wherever new penetrations are required, they shall maintain the watertight and fire ratings of the bulkhead or deck being penetrated. Existing non-poured bulkhead and deck penetrations may be reused. New Multi-Cable transits shall be Nelson type. Test all deck, bulkhead and hull penetrations in company with and to the satisfaction of the WSF and USCG Inspector, and the Vessel Staff Chief Engineer.

D. Remove and restore all interferences including insulation disturbed by this Item.

E. Conduct Power Meter test of all new cabling to insure the installation meet all requirements. Provide WSF Inspector with three (3) copies of test results.

F. Install the SC-1101 Processor unit in the void space below the Pilot House at the same location as the ADIS Processor. Install mounting plate on the newly installed flanges, mount Processor on the mounting plate with Stainless Steel Bolts, lock washers and Nuts.

G. WSF will provide the services of an Electronics Contractor to make the final terminations.

H. Prepare all surfaces affected by this work to an SSPC-SP3, Power Tool Cleaning. To prepared surfaces apply one (1) coat Wasser MC Miozinc Green, to a minimum of 3 mils (DFT) to prepared surfaces. Apply one (1) coat Wasser MC CR Buff, to a minimum of 3 mils (DFT) to all prepared surfaces. Hand-stripe all edges. Topcoat with Wasser MC Luster, to a minimum of 3 mils (DFT) to match exiting/surrounding colors.

31. PAINTING THE VEHICLE DECK AREA
{MAINTENANCE}

NOTE:
For bidding purposes, assume that a total of **2,000 SF**, in various areas will require preparation for painting. Upon completion of preparation, the Contract will be adjusted upwards or downwards to account for the actual area authorized by the WSF Inspector.

A. Prepare various areas, as directed by the WSF Inspector, throughout the Vehicle Deck Area an SSPC-SP 3, Power Tool Cleaning. Provide adequate manlifts to perform work.

B. Apply one (1) coat Wasser MC Miozinc Green, to a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces.

C. Apply one (1) coat Wasser MC CR Buff, to a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces. Hand-stripe all edges.

D. Top-coat with Wasser MC Luster, to a minimum of 3 mils (DFT) to match surrounding color**.**

32. INSTALLATION OF CELL PHONE CABLES TO NO. 1 AND NO. 2 END PILOT HOUSES

{NAVIGATION}

A. Run WSF furnished cabling (CAT 5E) to both pilothouses using existing cable runs and penetrations. Run simultaneous with ADIS cabling to the void space beneath No. 1 and No. 2 Pilot houses, with a minimum of extra 30 ft. length of cable at both Ends. If possible, ensure the cable is 12 inches away for the other cables; this is to prevent static or interference on the cell phones.

B. Remove and restore all interferences including insulation disturbed by this Item.

C. Conduct Power Meter tests of new cabling and provide a written report of readings. Provide three (3) copies of the report to the WSF Inspector.

33. HULL INSERT

{MAINTENANCE}

A. Remove and dispose of the remaining fuel in the Starboard fuel tank; the tank will be pumped to low suction when arrived at shipyard. Remaining fuel left at low suction will be approximate 150 Gals per tank.

B. Clean and gas free all spaces associated with the Work, as necessary, and obtain a Marine Chemist certificate for "SAFE FOR WORKERS", and "SAFE FOR HOT WORK". Maintain the certificate during the course of the Work. Provide fire watches as required.

C. Remove and restore all interferences including insulation disturbed by this Item.

D. Crop and renew a section of the hull with new Certified ABS Grade A Steel at the wind and waterline on the Starboard side from No.1 End Frame No. 6 to No. 2 End Frame No. 6. Approximate size of insert is 3 ft. wide and 30 ft. long of 17.85 lb. plate. Use as guidance **Attachment No. 10**, M.V. Tillikum, WSF Dwg. "Shell Plate Expansions". Provide documentation of new steel certification.

NOTE:

For bidding purposes, assume 90 Square Feet for Hull Steel Replacement. The Contract will be adjusted upward or downward to account for the actual area authorized by the WSF Inspector.

E. All welding will be approved by the WSF and USCG Inspectors, and Vessel Staff Chief Engineer.

F. NDT all the new welds. Testing of welds will be witnessed and approved by USCG and WSF Inspector.

G. Prepare all new steel to an SSPC-SP10, Near White Blast Cleaning, prior to installing. Apply one (1) coat of INTERNATIONAL Intertuf 262 epoxy, Red, to a minimum of 5 mils (DFT). Apply one (1) coat of INTERNATIONAL Intertuf 262 epoxy, Gray, to a minimum of 5 mils (DFT) of contrasting color to all surfaces painted. Hand-stripe all edges. No painting in the Fuel Tanks.

H. Prepare all other than new steel surfaces affected by this work to an SSPC-SP3, Power Tool Cleaning. Apply one (1) coat of INTERNATIONAL Intertuf 262 epoxy, Red, to a minimum of 5 mils (DFT). Apply one (1) coat of INTERNATIONAL Intertuf 262 epoxy, Gray, to a minimum of 5 mils (DFT) of contrasting color to all surfaces painted. Hand-stripe all edges. No painting in the Fuel Tanks.

I. For the exterior anti-fouling painting, paint is to be applied in accordance to the underwater hull Item.

J. For the interior painting, furnish and apply one (1) coat of INTERNATIONAL Intercare 755, of proper color, to a minimum of 2 mils (DFT) to all effected internal surfaces. No painting in the Fuel Tanks.

34. FLOAT FREE MODIFICATION
{SUBCHAPTER-W}

A. Make Float Free Modifications to Marine Evacuation System (MES) as indicated on **Attachment No. 11**, WSF DWG No. 8403W-475-16-01, Rev B, Dated 3/7/2003, Titled "New Marine Evacuation Slides Structural Modifications and Installation Details".

NOTE:
The Float-free Modifications required were part of Rev. A on **Attachment No 11**. These modifications include General Notes 25 & 26, Item No's. 33-36, rotating Item No. 8, EES Grab Bar Handle, as shown on Sheet 13 (Details 49-c, 50-a & 50-c), adding Item No. 34 pipe guard and Item No. 35, retaining clips, as shown on Sheet 19 along with Chocks, Item No. 36, and the retaining clip fasteners (see Partial Plan 76-A). Other sheets (9-12) show the finished modifications along with the EES Bowsing Line Stowage Bags, Item No. 33.

B. All Galvanized surface will be prepared with a coating of Formula 117, acid etch primer prior, to coating with International Intertuf 262. All new Galvanized surfaces will be prepared to an SSPC-SP1, Solvent Cleaning, prior to etching application.

C. Prepare all areas affected by this work to an SSPC-SP3 Power Tool Cleaning.

D. Apply one (1) coat Wasser MC Miozinc Green, to a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces.

E. Apply one (1) coat Wasser MC CR Buff, to a minimum of 3 mils (DFT) to all new surfaces and prepared surfaces. and-stripe all edges.

F. Top-coat with Wasser Mc Luster, to a minimum of 3 mils (DFT) to match surrounding color**.**

(END)